

Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Page : 3

view; and

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cont
an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the output of pixels imaging the same spectral band of light, wherein said optical system includes an image array sensor containing a plurality of pixels, and where the image processing system is configured to respond to a lower output from pixels imaging the predetermined field of view directly in front of the controlled vehicle than from pixels imaging other regions of the predetermined field of view.

95. (Twice Amended) A control system for automatically controlling the high beam state of the headlamps of a controlled vehicle comprising:

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an optical system for imaging external sources of light within a predetermined field of view onto an image sensor containing a plurality of pixels, said optical system configured to selectively transmit one or more predetermined spectral bands of light, and said optical system configured to image light within each predetermined spectral band onto particular portions of said image sensor; and

an image processing system for processing images from said optical system and providing a control signal for controlling the high beam state of the headlamps as a function of the output of one or more pixels within one of said portions relative to the output of other pixels within the same portion, wherein said image processing system provides a control signal for controlling the high beam state of the headlamps as a function of the output of pixels within one of said portions relative to the output of pixels within another one of said portions and where each of said pixels within one portion images substantially the same region of space as a corresponding pixel within the other portion.

REMARKS

The amendments and remarks presented herein are believed to be fully responsive to the Office Action mailed October 2, 2002.

Claims 54-99 remain pending in the application. Claims 60, 68, 83, 87, 88 and 95 have been amended herein. The amendments are fully supported in the specification and drawings as originally filed. No new matter has been added.

Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Page : 4

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attachment is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Applicants submit herewith additional information for consideration by the Examiner. In accordance with 37 CFR § 1.97(c)(2), a check in the amount of \$180 is also enclosed to cover the fee set forth in 37 CFR § 1.17(p).

ALLOWED AND ALLOWABLE CLAIMS

Claims 89-93 and 99 are allowed.

Claims 60, 68-83, 87, 88 and 95-97 were objected to as being dependent upon rejected base claims, but were indicated as being allowable if rewritten in independent form. Applicants have amended claims 60, 68, 83, 87, 88 and 95 to be in independent form, such that claims 60, 68-83, 87, 88 and 95-97 are now in condition for allowance.

CLAIM REJECTIONS

Claims 54-57, 59, 61-65, 94 and 98 were rejected under 35 U.S.C. §102(a) as being anticipated by Suzuki, JP 08166221. Claims 66, 67 and 84-86 were rejected under 35 U.S.C. §103(a) as being unpatentable over Suzuki. Claim 58 was rejected under 35 U.S.C. §103(a) as being unpatentable over Suzuki, in view of Fossum et al., U.S. Patent No. 5,471,515.

The present application is a continuation of U.S. patent application, Serial No. 09/135,565, filed on August 17, 1998, now U.S. Patent No. 6,097,023, which is a continuation of U.S. patent application, Serial No. 08/621,863, filed on March 25, 1996, now U.S. Patent No. 5,796,094, which is a continuation-in-part of U.S. patent application, Serial No. 08/023,918, filed on February 26, 1993, now U.S. Patent No. 5,550,677.

Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Page : 5

Applicants submit that support for the claims of the present application is included throughout the parent application, Serial No. 08/621,863, filed March 25, 1996, since the present application is a continuation of the 08/621,863 application and, thus, shares a common specification and drawings with the 08/621,863 application. Therefore, Applicants submit that the claimed subject matter of the present application is entitled to a priority date of at least March 25, 1996.

Applicants respectfully submit that because Suzuki was published or Laid-open on June 25, 1996, which is after the filing date of March 25, 1996 of the 08/621,863 application, Suzuki cannot be prior art to the present application under 35 U.S.C. §102(a). Therefore, the rejections are respectfully traversed and Applicants respectfully request reconsideration and withdrawal of the rejections of claims 54-59, 61-67, 84-86, 94 and 98.

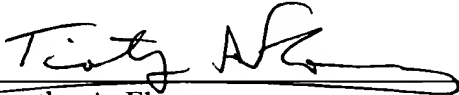
Claims 54-99 are pending in the application. Claims 89-93 and 99 are allowed and allowable claims 60, 68, 83, 87, 88 and 95 have been amended to be in independent form. Applicants respectfully traverse the rejection of claims 54-59, 61-67, 84-86, 94 and 98. Accordingly, Applicants respectfully submit that all of the claims pending in the present application are in condition for allowance and a notice to that effect is earnestly and respectfully requested.

Respectfully submitted,

KENNETH SCHOFIELD ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

Date: November 25, 2002.


Timothy A. Flory
Registration No. 42 540
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 975-5500

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art : 2878
Examiner : S. Allen
Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Filing Date : November 16, 1999
For : **VEHICLE HEADLIGHT CONTROL USING IMAGING SENSOR**

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

VERSION WITH MARKINGS TO SHOW CHANGES MADE

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IN THE CLAIMS:

Claims 60, 68, 83, 87, 88 and 95 have been amended as follows:

60. (Amended) A ~~The~~ control system as recited in Claim 57 for automatically controlling the state of the headlamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view, said optical system including an image array sensor containing a plurality of pixels; and

an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the

output of pixels imaging the same spectral band of light, wherein said optical system is further configured to spatially segregate light sources having different spectral compositions on said pixel image array sensor.

68. (Twice Amended) A ~~The~~ control system as recited in Claim 54 for automatically controlling the state of the headlamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view; and

an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the

Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Page : 2

output of pixels imaging the same spectral band of light, wherein said image processing system includes at least two photosensor arrays, and wherein said optical system comprises at least two lenses, one of said at least two lenses being configured to image onto one of said at least two photosensor arrays, and the other of said at least two lenses being configured to image onto the other of said at least two photosensor arrays.

83. (Amended) ~~A The control system as recited in Claim 67~~ for automatically controlling the state of the headlamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view, said optical system including two or more lenses and an image array sensor; and

an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the output of pixels imaging the same spectral band of light, wherein said image processing system includes means for computing the average output of a selected group of neighboring pixels in said image array sensor.

87. (Amended) ~~A The control system, as recited in Claim 54~~ for automatically controlling the state of the headlamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view; and

an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the output of pixels imaging the same spectral band of light, wherein said optical system includes an image array sensor containing a plurality of pixels, and where the control signal is based on a pixel threshold value that varies as a function of the predetermined field of view imaged by said plurality of pixels.

88. (Amended) ~~A The control system recited in Claim 54~~ for automatically controlling the state of the headlamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view; and

Applicants : Kenneth Schofield, Mark L. Larson and Keith J. Vadas
Serial No. : 09/441,341
Page : 3

an imaging processing system for processing images from said optical system and providing a control signal for controlling the state of the headlamps as a function of the output of pixels imaging the same spectral band of light, wherein said optical system includes an image array sensor containing a plurality of pixels, and where the image processing system is configured to respond to a lower output from pixels imaging the predetermined field of view directly in front of the controlled vehicle than from pixels imaging other regions of the predetermined field of view.

95. (Twice Amended) A ~~The control system as recited in Claim 94~~ for automatically controlling the high beam state of the headlamps of a controlled vehicle comprising:

an optical system for imaging external sources of light within a predetermined field of view onto an image sensor containing a plurality of pixels, said optical system configured to selectively transmit one or more predetermined spectral bands of light, and said optical system configured to image light within each predetermined spectral band onto particular portions of said image sensor; and

an image processing system for processing images from said optical system and providing a control signal for controlling the high beam state of the headlamps as a function of the output of one or more pixels within one of said portions relative to the output of other pixels within the same portion, wherein said image processing system provides a control signal for controlling the high beam state of the headlamps as a function of the output of pixels within one of said portions relative to the output of pixels within another one of said portions and where each of said pixels within one portion images substantially the same region of space as a corresponding pixel within the other portion.